

Application No. 10/790,509
Amendment dated October 3, 2006
Reply to Office Action of August 31, 2006

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REMARKS/ARGUMENTS

Applicant has carefully reviewed and considered the Office Action mailed on August 31, 2006, and the references cited therewith.

Claims 1, 8-9, 13, 15-19, and 22-23 are amended, no claims are canceled, and no claims are added; as a result, claims 1-23 are now pending in this application.

Claim Objections

Claims 8, 9, 13, 18-19, and 22-23 were objected to because of the following informalities:

In claim 8, lines 6-7, "dereference a virtual address space for a process associated with a removable, memory mappable device connected to the computer device" should be "dereference a virtual address space for a process associated with a removable[,] memory mappable device connected to the computer device.

In claim 9, line 3, "an operating system the computing device" should be "an operating system of the computing device.

In claim 13, line 8 "a removable, memory mappable device associate with the process" should be "a removable[,] memory mappable device associate with the process".

In claim 18, line 3, "the virtual address space in not available for use" should be "the virtual address space [in] is not available for use".

In claim 19, lines 2-3, "dereferencing a memory address for a process associated with a removable, memory mappable device" should be "dereferencing a memory address for a process associated with a removable[,] memory mappable device".

In claim 22, lines 2-3, "a removable, memory mappable device connected to a computing device", should be "a removable[,] memory mappable device connected to a computing device".

In claim 23, lines 23-4, "dereferencing a virtual address space for a process associated with a removable, memory address device" should be "dereferencing a

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virtual address space for a process associated with a removable[,] memory address device”.

Applicant has addressed the above recommended changes and respectfully requests reconsideration and withdrawal of the objection to these claims.

§ 112 Rejection of the Claims

Claims 15-18 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Antecedent basis issues were identified by the Examiner and have been addressed by the Applicant in the amendments.

Applicant respectfully requests reconsideration and withdrawal of the 112 rejection these claims.

§ 102 Rejection of the Claims

Claims 1-9, 11-22, and 23 were rejected under 35 USC § 102(e) as being anticipated by Browning et al. (U.S. Publication No. 2004/0064669). Applicant does not admit that Browning is indeed prior art and reserves the right to swear behind the same at a later date. Nonetheless, Applicant believes the present claims are distinguishable from the Browning reference for at least the following reasons.

Applicant respectfully submits that the present Application addresses at least in part memory management for removable memory mappable devices, i.e., devices that can be disconnected from a computing device. When such an action occurs, a memory management system of an operating system will release the physical memory space associated with that particular device according to that operating systems semantics. A process associated with the device, however, may not have yet released the virtual memory address associated with that physical address.

The Browning reference does not appear to address removable memory devices. Indeed Browning appears to be concerned with pretranslations becoming invalidated upon physical address changes, e.g., when a real (physical) page is

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migrated to a new real page, and synchronizing the invalidation process with the memory remove process. (Pp [0027]).

To this end, Browning lays forth in careful detail in Figure 9 and Pp[0061]-[0063] that memory migration and removal of real pages of memory are not removed until the kernel has received an acknowledgement of a sent interrupt from all CPUs and once received that all registered RPN lists have been scanned and all entries corresponding to real pages that are within the range of memory to be removed have been invalidated. This action is simply not possible in the case of removable devices where the semantics of the operating system operate to remove the physical pages associated with the removable device once the device has been disconnected albeit unknown to a process using a virtual memory address associated with that physical address.

In contrast to the Browning process of determining acknowledgement of interrupts and invalidation of relevant pretranslation lists prior to the migration and removal of real memory pages, Applicant's claims recite language covering the occurrence of physical memory page removed before the same is known to a process using that real memory.

For example, Applicant's independent claim 1, as amended, recites instructions which execute to:

release a physical address space associated with the virtual address space when the device has a connection removed from the computing device; and

register that the virtual address space, previously available to the process, is no longer valid for process use after the physical address space is released and before the process has released the virtual address space.

Applicant's independent claim 8, as amended, recites instructions which execute to:

release a physical address space associated with the virtual address space when the device associated with the process is logically disconnected; and

register in a virtual memory data structure of the memory management system that the virtual address space is no longer

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available to the process after the physical address space is released
and when the process has not yet released the virtual address space.

Applicant's independent claim 13, recites in part:

means for unmapping a virtual address space for a process
in a manner which does not violate semantics for an operating
system of the computing device when a removable memory
mappable device associated with the process is logically
disconnected.

Applicant respectfully submits that the Browning reference does not contain
any mention of unmapping in relation to the semantics of an operating system or in
relation to removable memory mappable devices.

Further, Applicant's independent claim 19, as amended, recites a method

which includes:

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virtual address space is no longer available to the process in a manner which does not violate semantics for an operating system the computing device.

As such, Applicant respectfully submits that each and every element and limitation as recited in independent claims 1, 8, 13, 19, 22, and 23 is not described in the Browning reference. Accordingly, the Browning reference does not support a 102 rejection of the above claims. Reconsideration and withdrawal of the 102 rejection for the above independent claims, as well as those claims which depend therefrom, is respectfully requested.

§103 Rejection of the Claims

Claim 10 was rejected under 35 USC § 103(a) as being unpatentable over Browning et al. (U.S. Publication No. 2004/0064669) in view of Microsoft Computer dictionary Fifth edition, and On-line Computing Dictionary (<http://www.instantweb.com/foldox/foldoc.cgi?query=kernel&action=Search>).

Claim 10 depends from independent claim 8. For the reasons provided above, Applicant respectfully submits that the Browning reference does not describe teach, or suggest each and every element and limitation of independent claim 8, as amended. The Microsoft Computer dictionary Fifth edition, and On-line Computing Dictionary (<http://www.instantweb.com/foldox/foldoc.cgi?query=kernel&action=Search>) do not cure the deficiencies with the Browning reference. That is the additional citations do not describe, teach, or suggest instructions which execute to:

release a physical address space associated with the virtual address space when the device associated with the process is logically disconnected; and
register in a virtual memory data structure of the memory management system that the virtual address space is no longer available to the process after the physical address space is released and when the process has not yet released the virtual address space.

As such, Applicant respectfully submits that the references do not, either independently or in combination, support a 103 rejection of independent claim 8 or claim 10, which depends therefrom. Accordingly, reconsideration and withdrawal of the 103 rejection of claim 10 is respectfully requested.

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CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Kevin Hart at (970) 898-7057 to facilitate prosecution of this matter.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

CERTIFICATE UNDER 37 CFR §1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS AMENDMENT Commissioner for Patents, P.O. BOX 1450, Alexandria, VA 22313-1450 on this 3rd day of October, 2006.

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Date: 10/3/2006